Re-engineering and Client/Server Computing

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Re-engineering and Client/Server Computing

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Re-engineering and Client/Server Computing

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Overview of BPR

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Definition of Business Process Re-engineering

"The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed."

- *Michael Hammer and James Champy*

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BPR is "Fundamental"

- Starting with the WHY?, not the HOW?
  - -Why do we do this?
  - -Why do we do it this way?
- Determine what the organization must do
- Examine how it should be done

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BPR is "Radical"

- BPR demands reinvention and redesign
- Existing procedures and structures must be disregarded
- Improvement or modification is not sufficient

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BPR is "Dramatic"

- BPR targets major improvements
- Incremental change is a function of traditional methodology—insufficient for BPR
- Use BPR to build a new road—not to repair the old surface

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BPR Focuses on the "Process"

- Business Process definition

  "A collection of activities that takes one or more kinds of input and creates an output that is of value to the customer".

  - *Michael Hammer and James Champy*

- The process must be redesigned without constraints of existing jobs, tasks or structures

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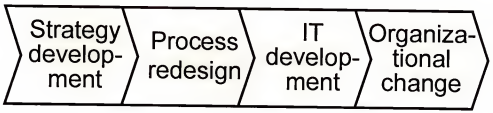
The BPR Continuum



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Characteristics of Reinvented Business Processes

- Broken processes - requirement for change
- Important processes - high customer impact
- Feasible processes - design is practical

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Process Characterized by: Broken or Disjointed Functions

- Often highlighted by:
  - Data duplication
  - Overlap betwen organizations
  - Excessive buffers to compensate for uncertainty

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Process Characterized by: Broken or Disjointed Functions

- Often highlighted by:
  - Unnecessary checking and controls
  - High volume of rework
  - Undue complexity

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Process Characterized by: Importance to Corporate Mission

- Customers may be internal or external to the company
- Customer issues may assist identification of important processes

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Process Characterized by: Feasibility of Redesign

- Tradeoff between process scope and potential for success
- High cost reduces feasibility
- Executive commitment to change is essential for success

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Role of Information Systems in BPR

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Role of Information Systems in BPR

- An understanding of available Information Technology is a prerequisite to succesful BPR
- Information Systems become enablers for BPR

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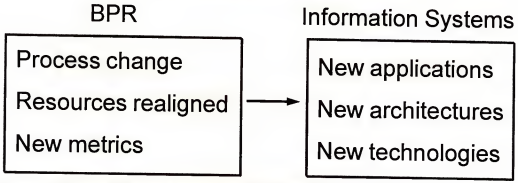
BPR Requires New Information Systems



New uses of technology enable business to implement redesigned processes

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Characteristics of Required Information Systems

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Characteristics of Required Information Systems

- Data integrated across applications
- Capability for rapid change
- Location independence
- Information accessibility

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New Applications

- Data integration driven by BPR
- Speed of market change must be reflected in speed of application development
- Closer association of business process to application

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New Architectures

- Combination of centralized and de-centralized approach
- Widespread availability of data essential for decentralized decision making
- Processing and data location determined by application need instead of by hardware restrictions

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New Technologies

- Rapid application development tools
- Client/Server CASE tools
- Systems and network management tools
- Desktop-based transaction management
- Voice/image recognition

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Sample BPR Enabling Technologies

- Client/Server development methodologies
- Imaging
- Distributed databases
- Intercompany and intracompany networks

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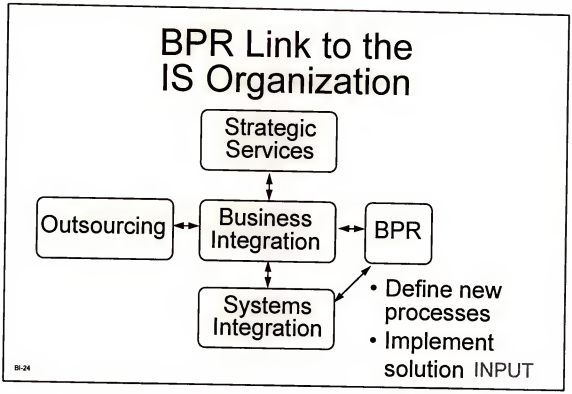

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Impacts of BPR on Client/Server

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Client/Server Definition

"Client/server is an architecture that assembles application software, databases, systems software and computer and networking equipment into a usable form... by which application and data processing is shared between client and server."

INPUT Definition Of Terms

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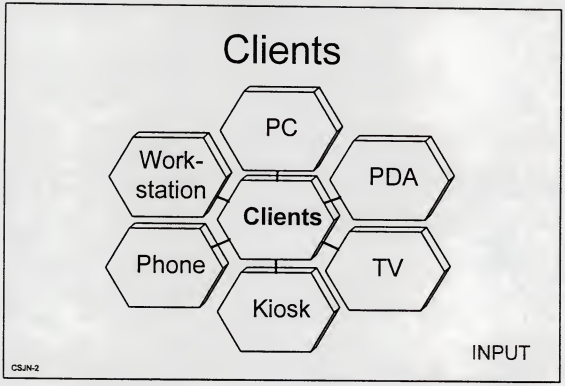

Notes:

PC - Personal Computer

Intel-based PC, Apple Macintosh, RISC-based Windows NT PC (NetPower, Acer)

Workstation

RISC-based (Sun, Digital, HP, IBM, Sony)

Phone

Intelligent phones will be more like PCs, PCs will add phone features

Kiosk

Public access to information, download CD-ROMs and videos (e.g., in Blockbuster)

TV

Servers access TVs via set-top boxes or built-in circuitry

PDA

Personal Digital Assistant - Apple/Sharp Newton, Tandy/Casio Zoomer will be connected to messaging systems

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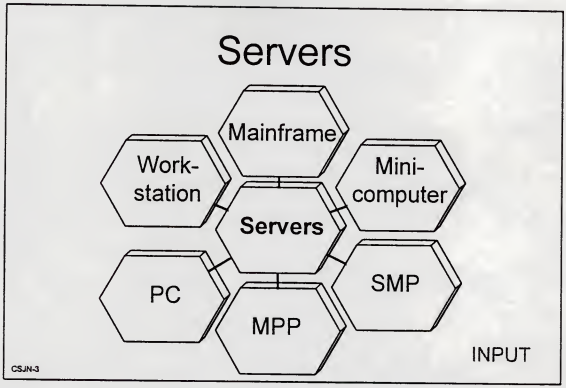

Notes:

Mainframe

Traditional mainframe and supercomputers costing more than $350,000

Workstation

High-performance RISC machines from $5,000 to $15,000

PC

Usually Intel-based machine <$5,000. However some PC servers may cost more when peripherals, memory and communications boards are added.

MPP

Massively parallel processors (NCube/Oracle, Thinking Machines).

SMP

Symmetric multi-processors (Sequent, Pyramid, HP).

Minicomputer

$15,000 to $350,000 includes traditional minicomputers from IBM (AS400), Digital and HP, also includes newer Intel-based machines from Tricord, NetFrame, Parallan.

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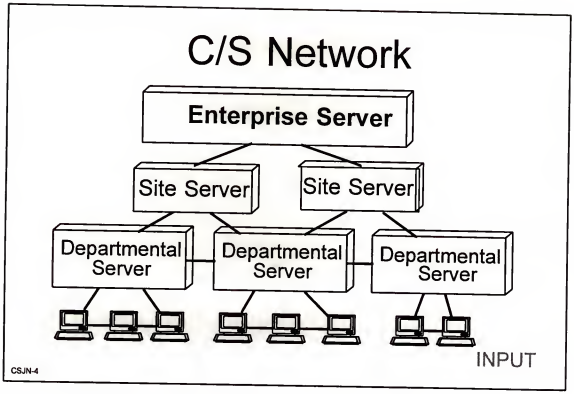

Notes:

"The network is the computer" - Sun Microsystems slogan

Typically C/S networks integrate at least three levels of servers: enterprise, site and departmental.

Enterprise server

Serves geographically dispersed enterprises, connects inside and outside the enterprise

Site server

Serves a single building, typically connected to other sites.

Departmental server

Typically PC or small minicomputer such as IBM AS/400.

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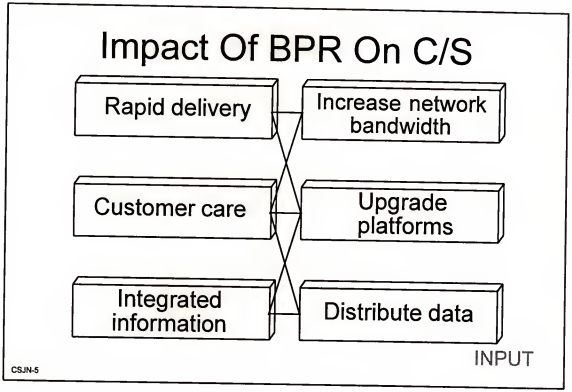

Notes:

C/S systems that are technology driven often fail. Before implementing a C/S system the business processes must be understood.

Key business processes that are being re-engineered to drive C/S implementation are:

- rapid delivery of goods, services and information
- customer care - businesses must support customers
- integrated information - most business can improve producivity if information is integrated

Successful engineering demands that the systems infrastructure is changed in three major ways:

- increase network bandwidth
- upgrade platforms - both clients and servers
- distribute data - this involves data conversion, new data entry and security systems, different query scripts, new reports

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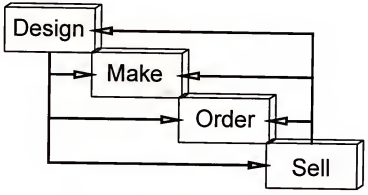
Rapid Delivery

- Industries are reducing time-to-market
  - insurance, automobile manufacturing, utilities



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Notes:

Insurance

An underwriter can use a workstation or a sales representative can use a portable computer to access risk assessment records, customer previous history and premium charges. This enables a quote for an insurance policy to be made immediately to a customer instead of waiting one to two weeks.

Automobile manufacturing

Designers are planning to use client/server workstations to create realistic 3-D models of cars instead of building clay models. This reduces time to market by several months.

Retailing

Suppliers and warehouses can be linked to point-of-sale terminals so orders can be replenished as they are used. Supplier may manage inventory. Can reduce time that supplier gets paid from weeks to days.

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Rapid Delivery

- Order in days instead of minutes
- Create 3-D models faster than engineers create clay prototypes
- Accelerate time-to-market by networking sales and design groups

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Notes:

Increase network bandwidth

Before networking, the Design-Make-Order-Sell data was typically interchanged on paper or on magnetic tape. Increased network bandwidth implies images and multimedia presentations can be transferred between engineering, manufacturing, marketing and sales departments.

Upgrade platforms

By providing engineers with RISC-based graphics workstations and modeling software, dramatic improvements in productivity can be made.

Distribute data

Shared databases enable customer data to be fed back to engineering to improve product designs. This reduces the time to create new products and enables companies to build to order cost effectively.

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Customer Care

- Customer service
- Personalized marketing
- Hospital patient care

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C/SJN-8

Notes:

Customer service

In customer service applications, particularly in utilities and telecommunications companies, INPUT's research shows that UNIX workstations, rather than DOS/Windows PCs, are being used as clients. This is because DOS/Windows solutions do not currently have the ability to handle multiple simultaneous database queries.

Personalized marketing

In industries from retailing to telecommunications, client/server systems enable customer data to be combined with direct mail systems.

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Integrate Information

- Financial analysis
- Human resources
- IT systems support

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C/SJN-9

Notes:

Business Integration

Finance, manufacturing, sales and human resources are linked to provide executive information. SAP (Germany) is a leading vendor.

Human Resources

PeopleSoft (Walnut Creek, CA) and Oracle (Redwood Shores, CA) are leading software vendors.

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Platform Selection

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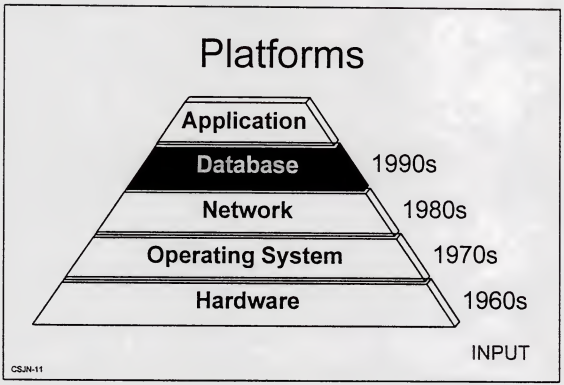

Notes:

Platform trends - the level of programming gets closer to the user over time

1960s - users selected hardware IBM, Univac - programmers understood hardware

1970s - operating system choices were available for users - e.g., IBM DOS, CMS

1980s - network was fundamental - NFS for Unix networks, SNA for IBM

1990s - whereas network, OS, hardware cannot be ignored, users and programmers typically select database environment (or programming libraries for nondatabase environments)

Late 909s - object-oriented environments based on application frameworks

INPUT's report "How Users Choose Platforms" discusses user priorities for selecting databases, networks, operating systems and hardware.

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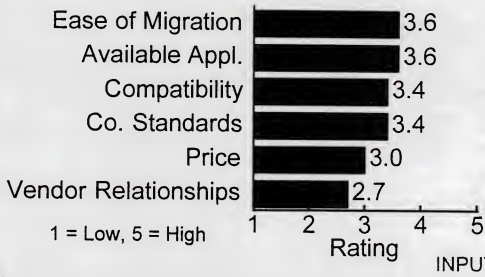
Database Selection Factors



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Notes:

Sample - 124 users, 4Q93

User were asked to rate the importance of the above factors on a scale of 1 to 5 (5 high).

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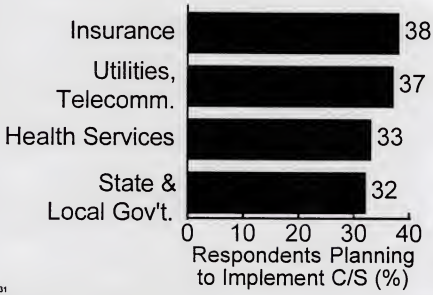
Top Industries For C/S



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Notes:

Insurance

Utilities and telecommunications

Medical

Least likely to implement C/S

Banking - needs more security, highly specialized systems

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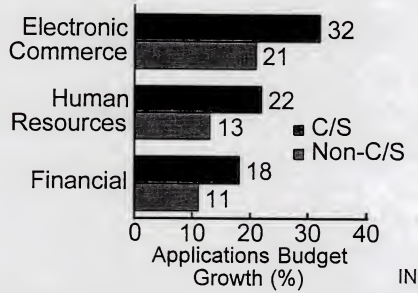
C/S Applications Growth



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C/SJN-32

Notes:

US market survey, 1993, surveyed users and IT managers

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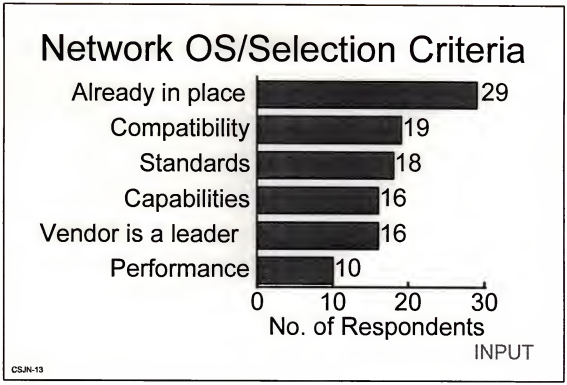

Notes:

Sample - 115 users, 4Q93

Chart shows number of respondents

Users were asked the primary reasons for selecting a network operating system (NOS). Over 60% selected Novell's Netware, citing interoperability or compatibility with multiple operating systems as a key strength.

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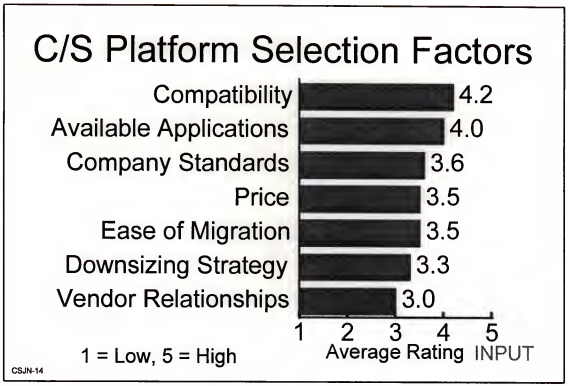

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Role Of IS

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Organizational Roles

- Role of IS
  - Primary platform selection
  - Build infrastructure
- Role of user managment
  - Applications design and requirements
  - Economic justification for project
- Role of committee
  - Jointly plan implementation and requirement review

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CSJN-16

Notes:

This is a summary of the results of a study undertaken with 124 user organizations in 1993.

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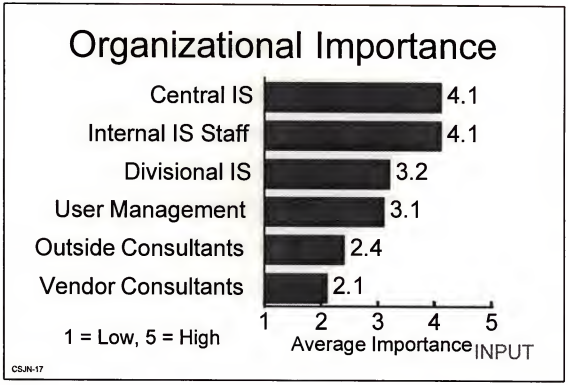

Notes:

Users were asked which organizations they felt had the most influence on a scale from 1 to 5.

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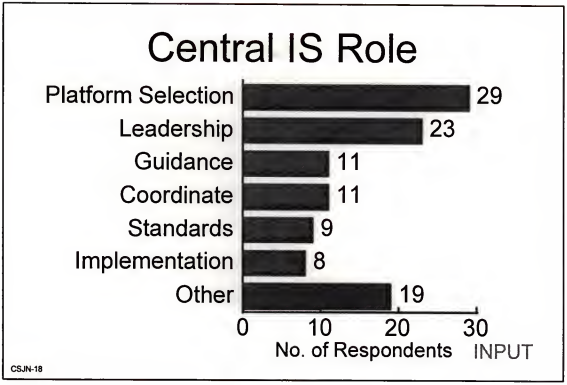

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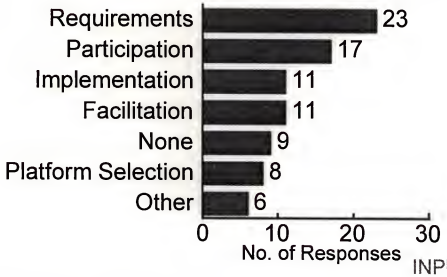
Divisional IS Role



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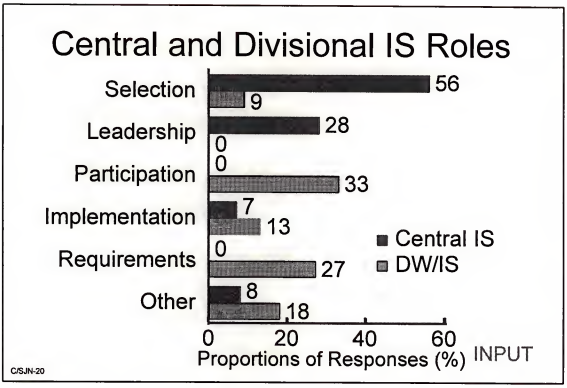

Notes:

This is a comparison of the previous two slides,

Central IS is more involved in platform selection than divisional IS.

Divisional IS has more influence on user requirements than central IS.

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Open Versus Proprietary Systems

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Open Versus Proprietary

- Open
  - Sun - programmers can move applications to other UNIX machines
  - Microsoft - users can move applications on PCs
  - Apple - users can add peripherals while the computer is running

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CSJN-22

Notes:

There is some controversy as to what constitutes open systems. Originally open systems meant systems that were developed using UNIX because the operating system did not belong to a hardware vendor.

Sun Microsystems built its business on being an open systems company. In reality they had a proprietary architecture.

Microsoft then claimed to belong to the open systems movement because it had more users of DOS and Windows than of other operating systems. Besides any PC application can run on any PC manufacturer's machine, therefore Microsoft must be an open vendor.

Apple too tried to claim it had an open system, despite a highly proprietary environment because it adopted industry standards like SCSI for disk drive and peripheral interfaces and Postscript for printers. Hence Apple claims to provide an open solution because it is easy to add components to a Macintosh.

In reality no system is open.

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Open Versus Proprietary

- Proprietary
  - -NeXT - difficulties marketing superior development platform
  - -Nintendo - over 100 million installed worldwide

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Open Systems Organizations

- X/Open
- COSE - Cooperative Open Software Environment
- OMG - Object Management Group
- OSF - Open Systems Foundation

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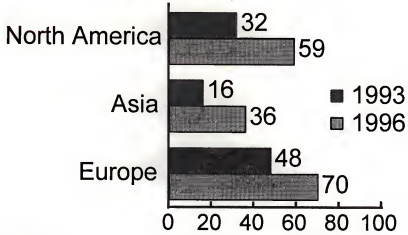
Percentage Spending on Open Systems



Source: X/Open 1993

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Open System Advantages For Users

- Choice of vendors
- Incremental upgrades
- Competitive prices
- Wide range of software

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Proprietary System Advantages For Users

- Fits well with user needs
- Fewer interfaces to fail
- Simpler system integration
- Innovative applications

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Client/Server Related Systems Integration Market

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Challenges For SI Firms

- Industry knowledge
- Project management
- Training architects and programmers
  - C/S architects must understand interoperability
  - Programming skills become obsolete

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Notes:

Industry knowledge

The most important factor for a systems integrator is an understanding of the customer's environment. This means knowing which C/S systems will benefit the customer's business, when processes have to be re-engineered and knowing how to create a win-win contract.

Project management

Knowing the priorities for programmers and the order in which tasks must be accomplished is a key project management activity. In C/S systems throw away code is often developed, this must be understood by the project manager.

Training architects and programmers

It takes one year to train a Windows C++ programmer, most SI programmers will be at a higher level. Programmers need to be constantly educated as new tools emerge.

Building standard object libraries

These give a company a proprietary edge. If object standards emerge that are incompatible with the system integrator's objects then the SI vendor must retrain staff.

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Challenges For SI Firms

- Building standard object libraries
  - Object library standards are still evolving
  - Building non-standard object collections is risky

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SI Market Entry Strategies

- Outsource
- Upsize
- Downsize
- Connect
- Innovate

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Notes:

Outsource

A systems integrator can run old systems for a customer to free up the customers resources. Typically the SI vendor becomes the organization that outsources the mainframe for the vendor.

Upsize

Growing companies frequently mention that the reason for moving to C/S is to organize their data and add more powerful servers.

Downsize

Typically large established organizations are interested in downsizing.

Connect

A major strategy, as implemented by Digital Equipment Corporation, is to offer to connect a customers systems with networks, computers and software.

Innovate

There is a wealth of opportunity for innovators who can implement video servers, multimedia servers, supercomputers and workstation clients.

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Major Vendors

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IBM Strategy

- C/S platforms
  - OS/2, Windows, Workplace, AIX
  - AS/400, RS/6000, mainframe
- Technologies
  - Microprocessors, communications, OO programming

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CSJN-35

Notes:

OS/2 is starting to penetrate client PC operating system market

- technology leader - multiprocessing, reliable memory management
- user benefits - runs DOS and Windows applications together
- one-third cost, one-half memory requirements of Windows NT

Microprocessors

- POWER scaleable architecture (from mainframes to PDAs) and Intel

Communications

- ATM for multimedia applications - will sell to OEMs
- wireless technologies for mobile users - CDPD, in-flight phones
- networked kiosks to access digital inventory- CDs, videos - in retail stores

Object-oriented programming

- DSOM - distributed objects starting on OS/2 and UNIX
- Taligent - IBM, Apple, HP venture to develop application frameworks
- IBM Smalltalk developments

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IBM Announcements

- Workplace - operating system
- AS/400 open connectivity
- DB2 for non-IBM platforms. e.g., HP
- DSOM distributed objects

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IBM Case Study I

- MCI
  - Customer service for long distance phone services
  - 15 minutes instead of 7 days to sell new service
  - Result: successful “friends & family” service
  - 21 servers in 7 regions

INPUT

CSJN-37

Notes:

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IBM Case Study II

- University of N. Carolina Hospitals
  - Instant instead of 2 hours to locate patient records
  - Linked Stratus, Data General, Digital, IBM computers

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CSJN-38

Notes:

2/94

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ISSC Case Study

- State of Michigan
  - Management information for 28 agencies
  - Database with Mac & Windows clients
  - Outsourced server for financial applications
  - Partnered with other IBM divisions
    - IBM Consulting - design
    - Advantis (IBM & Sears venture) - network services
    - IBM Open Systems Center - interoperability testing

INPUT

CSJN-39

Notes:

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Andersen Consulting

- C/S platforms
  - FOUNDATION for Cooperative Processing - client/server methodology, tools and services
- Strategy
  - Reinvent the business with BPR
  - Strong industry focus
  - Global teaming

INPUT

CSJN-40

Notes:

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Andersen's FOUNDATION

- Introduced 1991
- Client/server methodology and tools
  - Rapid Application Builder
  - Connects multiple platforms
  - LAN-based RDBMS stores business objects
  - Message-based framework
- Used by over 80 companies

INPUT

CSJN-41

Notes:

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Andersen C/S Business

- 8,000 consultants with C/S skills in 1993
- FOUNDATION supports
  - HP-UX, Digital's Ultrix
  - OS/2, VAX/VMS, CICS servers
  - Windows, OS/2 clients
- Estimates 70-75% of work to be C/S related

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CSJN-42

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Andersen Announcements

- Sun Microsystems strategic alliance
  - Andersen markets C/S systems to oil and gas industry for energy trading, refining, logistics
- Digital Equipment support
  - Alpha-based OSF/1 server due 2Q94
  - Joint sales and marketing

C/SJN-43

Notes:

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Andersen Case Study I

- US Sprint Customer Service
  - Built C/S system in less than a year
  - Uses agents to search for information in 8 databases
  - Sprint able to reuse 60% to 80% of the code
  - Customer service productivity up 30%

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CSJN-44

Notes:

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Andersen Case Study II

- Mortgage Guaranty Insurance, Wisconsin
  - Loan approval system
  - C/S system - 300 workstations, mainframe, expert systems
  - Loan approvals take minutes instead of days

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CSJN-45

Notes:

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EDS Strategy

- Outsourcing and transition management
- Technologies
  - Distributed processing
  - Network communications
  - Microprocessor technology
  - Advanced user interfaces
- Lags Andersen and SHL Systemhouse in C/S

INPUT

CSJN-46

Notes:

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EDS Announcements

- Antares Alliance Group formed with Amdahl
  - EDS software and Amdahl's Huron C/S tools
  - Rapid development and maintenance for C/S
  - PC to mainframe distributed processing support
- Acquired Ampersand Corp.
  - C/S bank branch automation software developer

INPUT

CSJN-47

Notes:

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EDS Case Study I

- Apple Computer
  - Apple Document Management and Control System
  - Networked Macintoshes across 13 sites
  - 120,000 engineering diagrams, images
  - Documents can be retrieved in seconds instead of days

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CSJN-48

Notes:

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EDS Case Study II

- EDS Technical Products Division
  - Real-time automated distribution system
  - Bar-code and inventory information in C/S system
  - Deployed in 9 months, 5x staff productivity, 30x number of customers

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CSJN-49

Notes:

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SHL Systemhouse

- Canadian company, 4500 professionals
- Early leader in C/S SI using UNIX
- Technologies
  - Focus on UNIX and open systems
- Strategy
  - Grow by acquisition
  - Improve financial stability

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CSJN-50

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SHL Acquisitions

- Nidak Associates
  - Regional C/S expertise - Toronto, Canada
- Application & Business Solutions
  - AS/400 applications consulting - Cypress, CA
- XL/Proteus
  - C/S and network solutions vendor - Boston, MA

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CSJN-51

Notes:

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SHL Accounts

- Computerland
  - Outsource mainframe and migrate to C/S
- Canada Post
  - $1B estimated "fee for service" contract
  - C/S outsourcing over 10 years
  - Also selling technology to U.S. Postal Service
- Taco Bell, Los Angeles Fire Dept.

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CSJN-52

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PETER A. CUNNINGHAM
PRESIDENT

PROFILE

- Mr. Cunningham has 28 years of experience in the information technology industry, including over 20 years of P&L responsibility in consulting.
- Mr. Cunningham provides information and advice to users and vendors of information technology. He specializes in analysis and forecasting of major trends in the industry, particularly in software, services, and the impact of information technology on people and organizations.
- In 1974, Mr. Cunningham founded INPUT to provide planning services, market research and consulting to buyers and vendors of IT products and services on a worldwide basis. The company specializes in analyzing and forecasting the applications and use of IT, particularly through the information services industry. This industry is now over $250 billion per year in size and is being driven by trends in outsourcing, systems integration, and downsizing. INPUT's mission is to provide its clients the ability to benefit from these and other IT trends and opportunities.
- Previously, he was a founder and President of J.W. Goodhew and Associates, Inc., a Washington, D.C. data processing consulting company specializing in the Medicaid, association, and manufacturing industries, as well as the federal government. Prior to that, Mr. Cunningham was with Management Science America, responsible for data processing projects in government and industry.
- Mr. Cunningham came to the United States with C-E-I-R, for whom he performed systems development and management.
- Mr. Cunningham started his career with ICL in 1964 in systems software development.

EDUCATION

- B.Sc. (Physics), Associate of the Royal College of Science, Imperial College, London
- M.P.A. (Technology of Management), The American University, Washington, D.C.

MEMBERSHIPS

- Fellow of the British Computer Society
- Member of the Worshipful Company of Information Technologists (Guild of the City of London)

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  - Vertical industry analysis
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- **Customer satisfaction levels**
- **Competitive positioning**
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- **Peer position**

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M&S 459/01 2/94

Re-engineering and Client/Server Computing

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Overview of BPR

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Definition of Business Process Re-engineering

"The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed."

- *Michael Hammer and James Champy*

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BPR is "Fundamental"

- Starting with the WHY?, not the HOW?
  - Why do we do this?
  - Why do we do it this way?
- Determine what the organization must do
- Examine how it should be done

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BPR is "Radical"

- BPR demands reinvention and redesign
- Existing procedures and structures must be disregarded
- Improvement or modification is not sufficient

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BPR is "Dramatic"

- BPR targets major improvements
- Incremental change is a function of traditional methodology—insufficient for BPR
- Use BPR to build a new road—not to repair the old surface

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BPR Focuses on the "Process"

- Business Process definition

  "A collection of activities that takes one or more kinds of input and creates an output that is of value to the customer".

  - *Michael Hammer and James Champy*

- The process must be redesigned without constraints of existing jobs, tasks or structures

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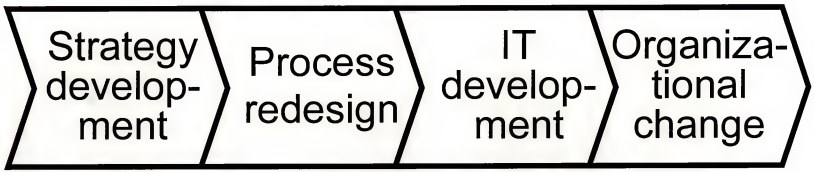
The BPR Continuum



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Leading BPR Service Providers (U.S.)

- Andersen Consulting
- McKinsey & Co.
- CSC Index
- EDS Consulting Services
- Bain & Co.
- Hammer & Co.

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Characteristics of Reinvented Business Processes

- Broken processes - requirement for change
- Important processes - high customer impact
- Feasible processes - design is practical

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Process Characterized by: Broken or Disjointed Functions

- Often highlighted by:
  - Data duplication
  - Overlap betwen organizations
  - Excessive buffers to compensate for uncertainty

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Process Characterized by: Broken or Disjointed Functions

- Often highlighted by:
  - Unnecessary checking and controls
  - High volume of rework
  - Undue complexity

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Process Characterized by: Importance to Corporate Mission

- Customers may be internal or external to the company
- Customer issues may assist identification of important processes

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Process Characterized by: Feasibility of Redesign

- Tradeoff between process scope and potential for success
- High cost reduces feasibility
- Executive commitment to change is essential for success

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Role of Information Systems in BPR

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Role of Information Systems in BPR

- An understanding of available Information Technology is a prerequisite to succesful BPR
- Information Systems become enablers for BPR

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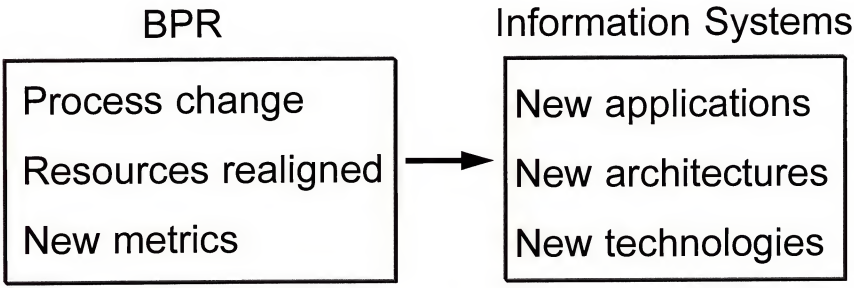
BPR Requires New Information Systems



New uses of technology enable business to implement redesigned processes

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Characteristics of Required Information Systems

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Characteristics of Required Information Systems

- Data integrated across applications
- Capability for rapid change
- Location independence
- Information accessibility

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New Applications

- Data integration driven by BPR
- Speed of market change must be reflected in speed of application development
- Closer association of business process to application

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New Architectures

- Combination of centralized and de-centralized approach
- Widespread availability of data essential for decentralized decision making
- Processing and data location determined by application need instead of by hardware restrictions

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New Technologies

- Rapid application development tools
- Client/Server CASE tools
- Systems and network management tools
- Desktop-based transaction management
- Voice/image recognition

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Sample BPR Enabling Technologies

- Client/Server development methodologies
- Imaging
- Distributed databases
- Intercompany and intracompany networks

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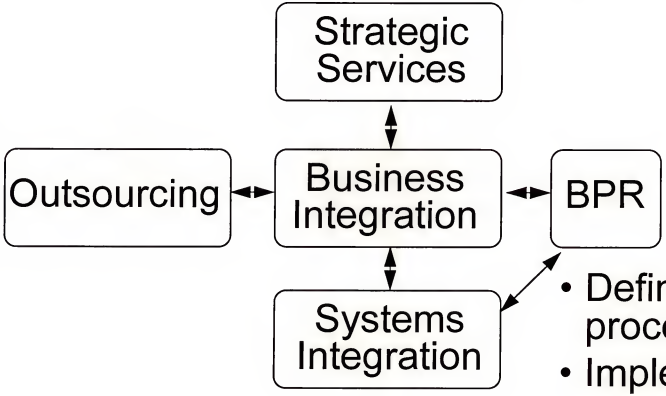
BPR Link to the IS Organization



- Define new processes
- Implement solution

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Impacts of BPR on Client/Server

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Client/Server Definition

"Client/server is an architecture that assembles application software, databases, systems software and computer and networking equipment into a usable form... by which application and data processing is shared between client and server."

INPUT Definition Of Terms

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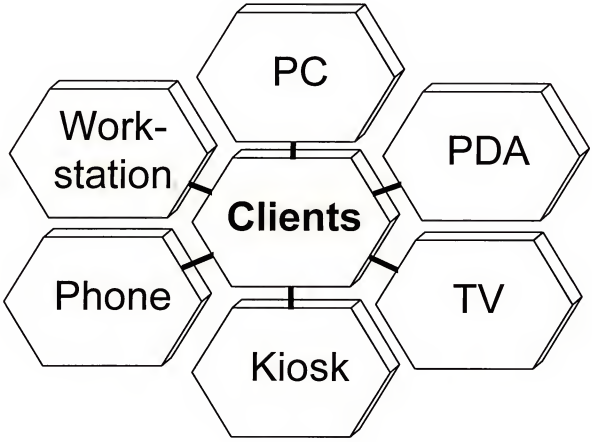
Clients



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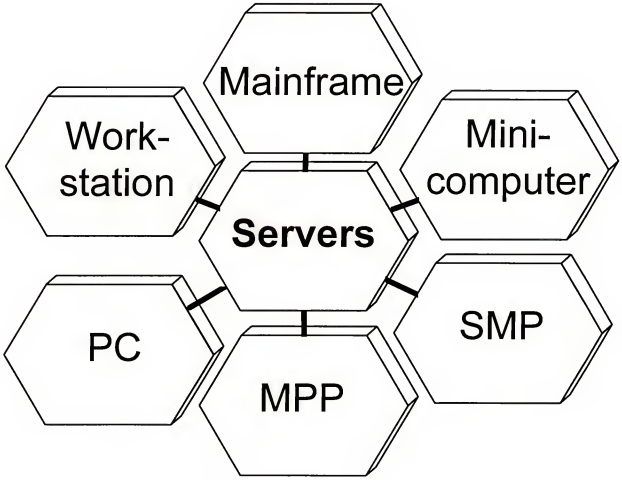
Servers



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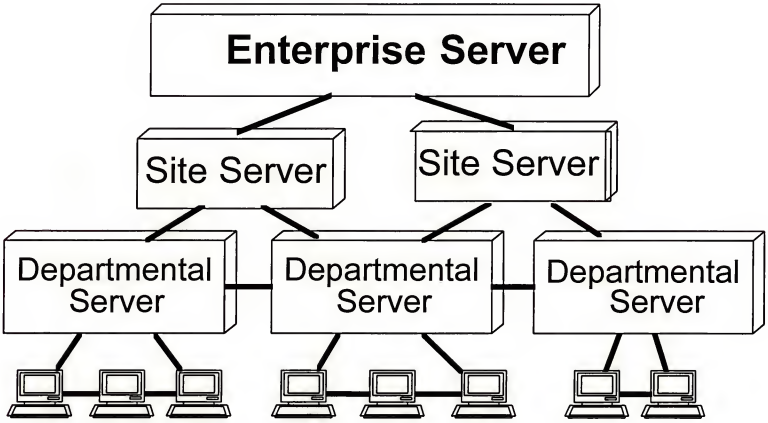
C/S Network



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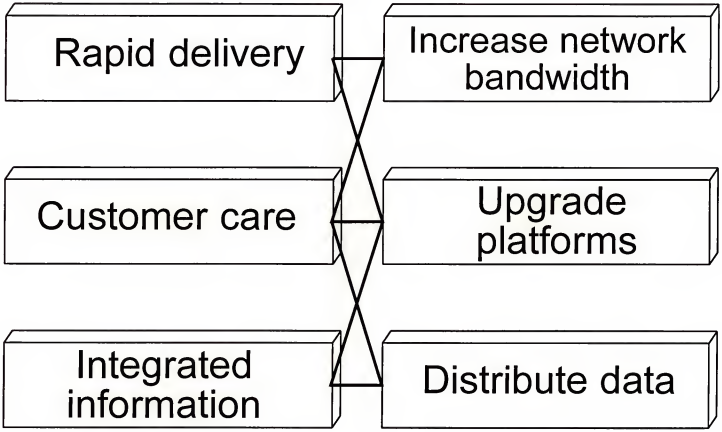
Impact Of BPR On C/S



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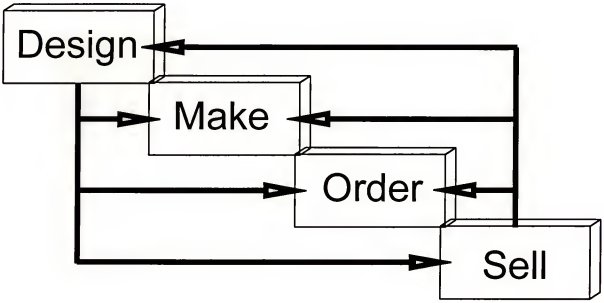
Rapid Delivery

- Industries are reducing time-to-market
  - insurance, automobile manufacturing, utilities



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Rapid Delivery

- Order in days instead of minutes
- Create 3-D models faster than engineers create clay prototypes
- Accelerate time-to-market by networking sales and design groups

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Customer Care

- Customer service
- Personalized marketing
- Hospital patient care

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Integrate Information

- Financial analysis
- Human resources
- IT systems support

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Platform Selection

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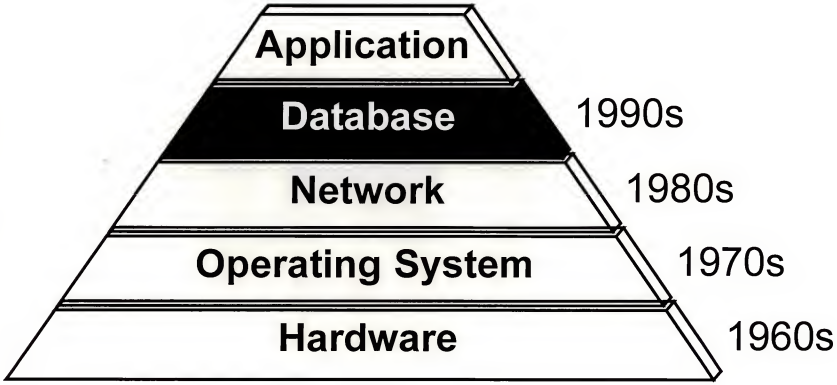
Platforms



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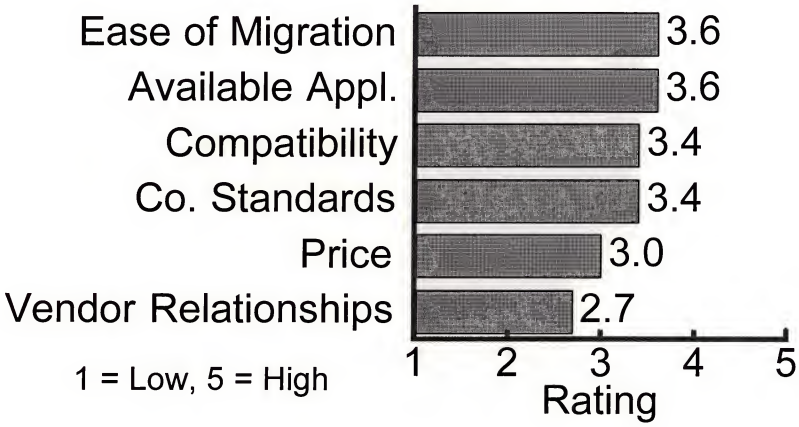
Database Selection Factors



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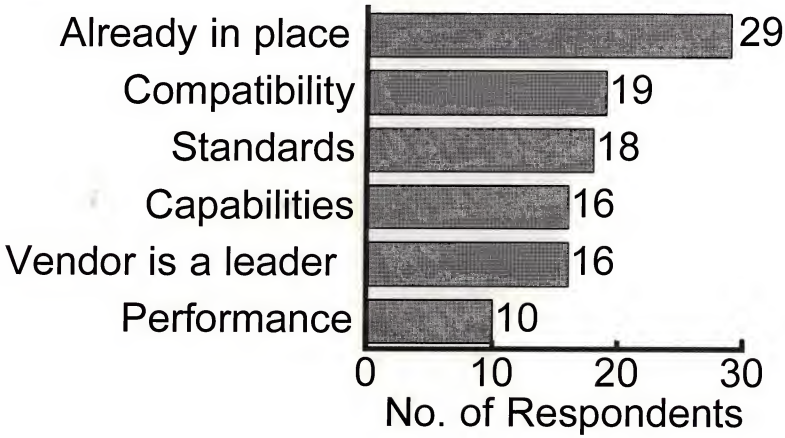
Network OS/Selection Criteria



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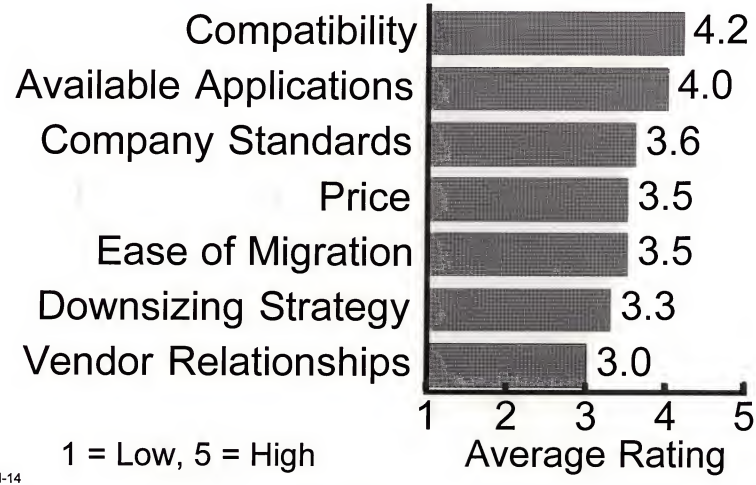
C/S Platform Selection Factors



1 = Low, 5 = High

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Role Of IS

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Organizational Roles

- Role of IS
  - Primary platform selection
  - Build infrastructure
- Role of user managment
  - Applications design and requirements
  - Economic justification for project
- Role of committee
  - Jointly plan implementation and requirement review

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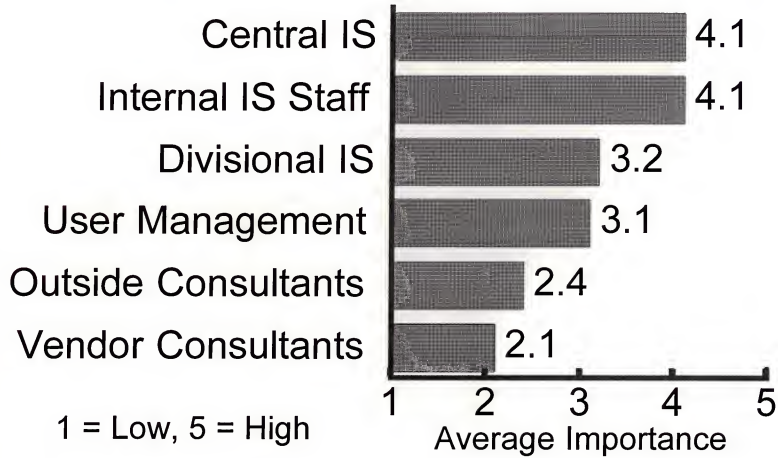
Organizational Importance



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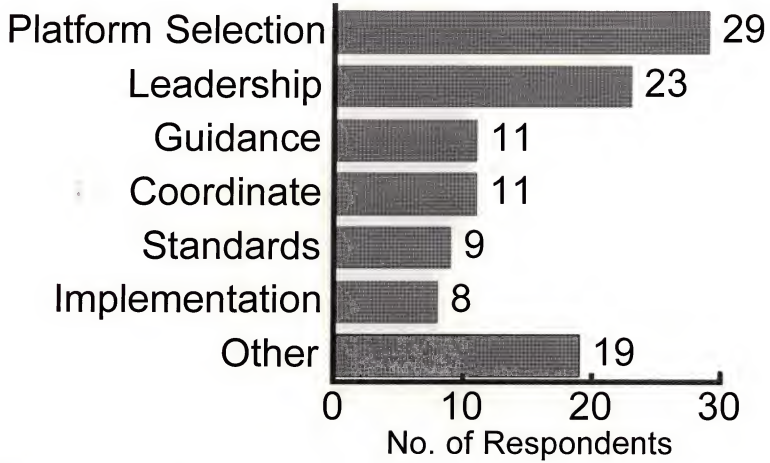
Central IS Role



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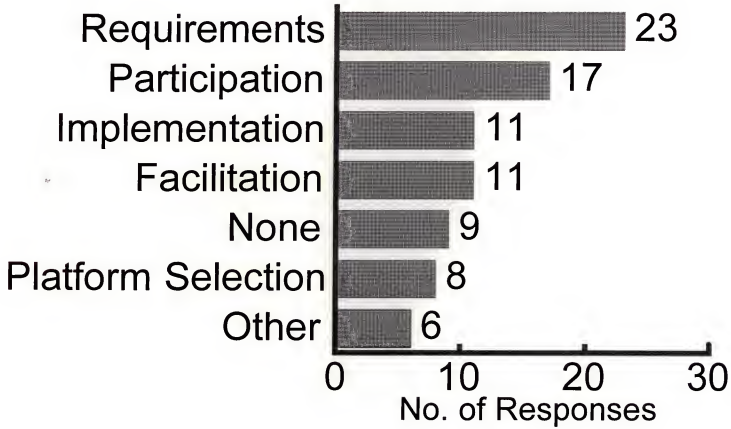
Divisional IS Role



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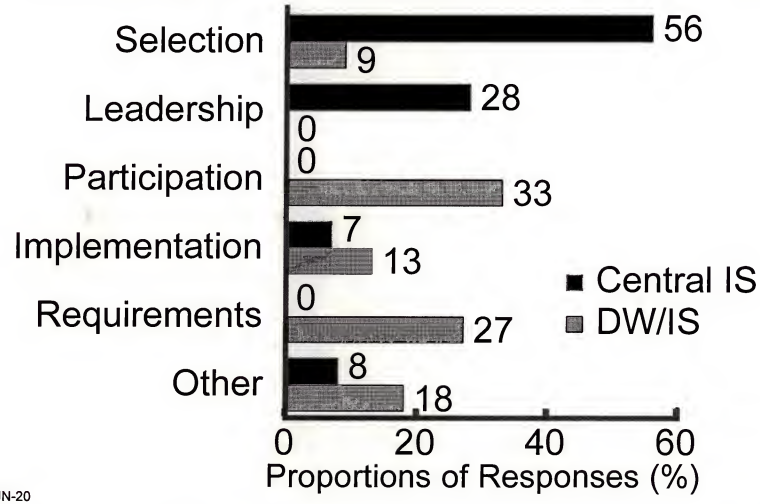
Central and Divisional IS Roles



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Open Versus Proprietary Systems

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Open Versus Proprietary

- Open
  - Sun - programmers can move applications to other UNIX machines
  - Microsoft - users can move applications on PCs
  - Apple - users can add peripherals while the computer is running

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Open Versus Proprietary

- Proprietary
  - -NeXT - difficulties marketing superior development platform
  - -Nintendo - over 100 million installed worldwide

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Open Systems Organizations

- X/Open
- COSE - Cooperative Open Software Environment
- OMG - Object Management Group
- OSF - Open Systems Foundation

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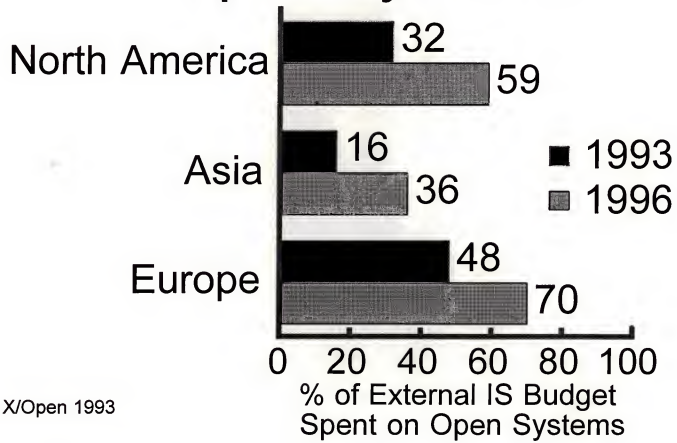
Percentage Spending on Open Systems



Source: X/Open 1993

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Open System Advantages For Users

- Choice of vendors
- Incremental upgrades
- Competitive prices
- Wide range of software

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Proprietary System Advantages For Users

- Fits well with user needs
- Fewer interfaces to fail
- Simpler system integration
- Innovative applications

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Client/Server Related Systems Integration Market

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Challenges For SI Firms

- Industry knowledge
- Project management
- Training architects and programmers
  - C/S architects must understand interoperability
  - Programming skills become obsolete

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Challenges For SI Firms

- Building standard object libraries
  - Object library standards are still evolving
  - Building non-standard object collections is risky

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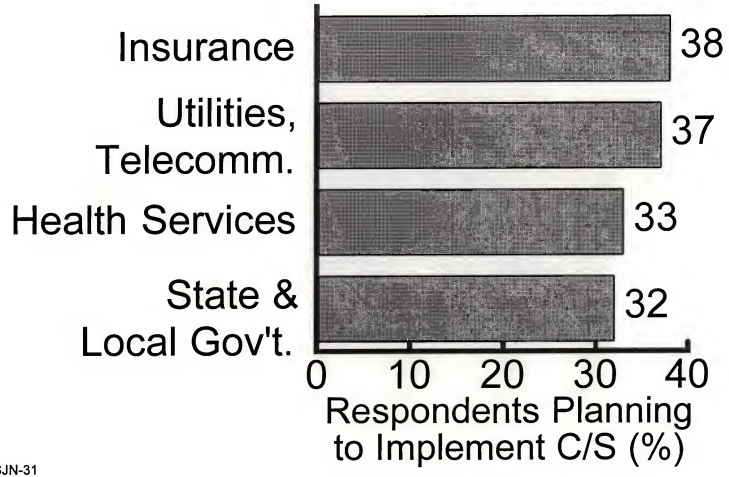
Top Industries For C/S



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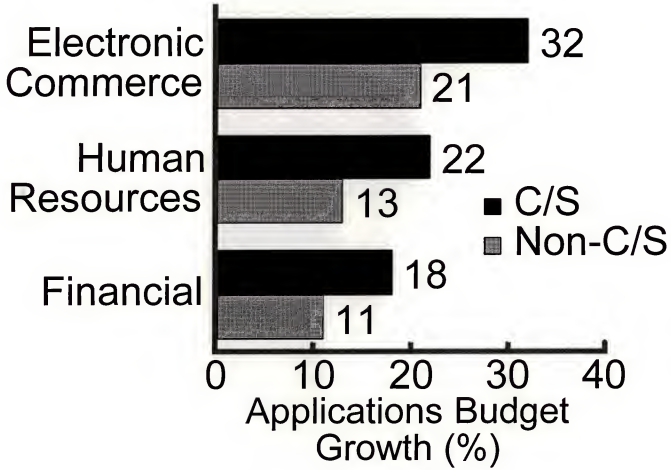
C/S Applications Growth



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SI Market Entry Strategies

- Outsource
- Upsize
- Downsize
- Connect
- Innovate

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Major Vendors

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IBM Strategy

- C/S platforms
  - OS/2, Windows, Workplace, AIX
  - AS/400, RS/6000, mainframe
- Technologies
  - Microprocessors, communications, OO programming

C/SJN-35

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IBM Announcements

- Workplace - operating system
- AS/400 open connectivity
- DB2 for non-IBM platforms. e.g., HP
- DSOM distributed objects

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IBM Case Study I

- MCI
  - Customer service for long distance phone services
  - 15 minutes instead of 7 days to sell new service
  - Result: successful “friends & family” service
  - 21 servers in 7 regions

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IBM Case Study II

- University of N. Carolina Hospitals
  - Instant instead of 2 hours to locate patient records
  - Linked Stratus, Data General, Digital, IBM computers

C/SJN-38

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ISSC Case Study

- State of Michigan
  - Management information for 28 agencies
  - Database with Mac & Windows clients
  - Outsourced server for financial applications
  - Partnered with other IBM divisions
    - IBM Consulting - design
    - Advantis (IBM & Sears venture) - network services
    - IBM Open Systems Center - interoperability testing

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Andersen Consulting

- C/S platforms
  - FOUNDATION for Cooperative Processing - client/server methodology, tools and services
- Strategy
  - Reinvent the business with BPR
  - Strong industry focus
  - Global teaming

C/SJN-40

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Andersen's FOUNDATION

- Introduced 1991
- Client/server methodology and tools
  - Rapid Application Builder
  - Connects multiple platforms
  - LAN-based RDBMS stores business objects
  - Message-based framework
- Used by over 80 companies

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Andersen C/S Business

- 8,000 consultants with C/S skills in 1993
- FOUNDATION supports
  - HP-UX, Digital's Ultrix
  - OS/2, VAX/VMS, CICS servers
  - Windows, OS/2 clients
- Estimates 70-75% of work to be C/S related

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Andersen Announcements

- Sun Microsystems strategic alliance
  - Andersen markets C/S systems to oil and gas industry for energy trading, refining, logistics
- Digital Equipment support
  - Alpha-based OSF/1 server due 2Q94
  - Joint sales and marketing

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Andersen Case Study I

- US Sprint Customer Service
  - Built C/S system in less than a year
  - Uses agents to search for information in 8 databases
  - Sprint able to reuse 60% to 80% of the code
  - Customer service productivity up 30%

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Andersen Case Study II

- Mortgage Guaranty Insurance, Wisconsin
  - Loan approval system
  - C/S system - 300 workstations, mainframe, expert systems
  - Loan approvals take minutes instead of days

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EDS Strategy

- Outsourcing and transition management
- Technologies
  - Distributed processing
  - Network communications
  - Microprocessor technology
  - Advanced user interfaces
- Lags Andersen and SHL Systemhouse in C/S

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EDS Announcements

- Antares Alliance Group formed with Amdahl
  - EDS software and Amdahl's Huron C/S tools
  - Rapid development and maintenance for C/S
  - PC to mainframe distributed processing support
- Acquired Ampersand Corp.
  - C/S bank branch automation software developer

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EDS Case Study I

- Apple Computer
  - Apple Document Management and Control System
  - Networked Macintoshes across 13 sites
  - 120,000 engineering diagrams, images
  - Documents can be retrieved in seconds instead of days

C/SJN-48

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EDS Case Study II

- EDS Technical Products Division
  - Real-time automated distribution system
  - Bar-code and inventory information in C/S system
  - Deployed in 9 months, 5x staff productivity, 30x number of customers

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SHL Systemhouse

- Canadian company, 4500 professionals
- Early leader in C/S SI using UNIX
- Technologies
  - Focus on UNIX and open systems
- Strategy
  - Grow by acquisition
  - Improve financial stability

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SHL Acquisitions

- Nidak Associates
  - Regional C/S expertise - Toronto, Canada
- Application & Business Solutions
  - AS/400 applications consulting - Cypress, CA
- XL/Proteus
  - C/S and network solutions vendor - Boston, MA

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SHL Accounts

- Computerland
  - Outsource mainframe and migrate to C/S
- Canada Post
  - $1B estimated "fee for service" contract
  - C/S outsourcing over 10 years
  - Also selling technology to U.S. Postal Service
- Taco Bell, Los Angeles Fire Dept.

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